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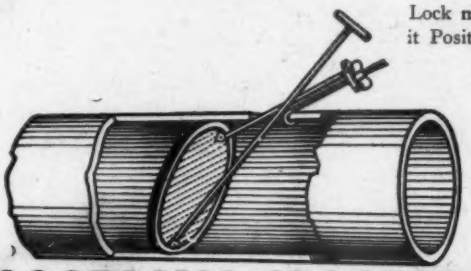
When Shutting off Street Mains
a Reliable Method is to use a



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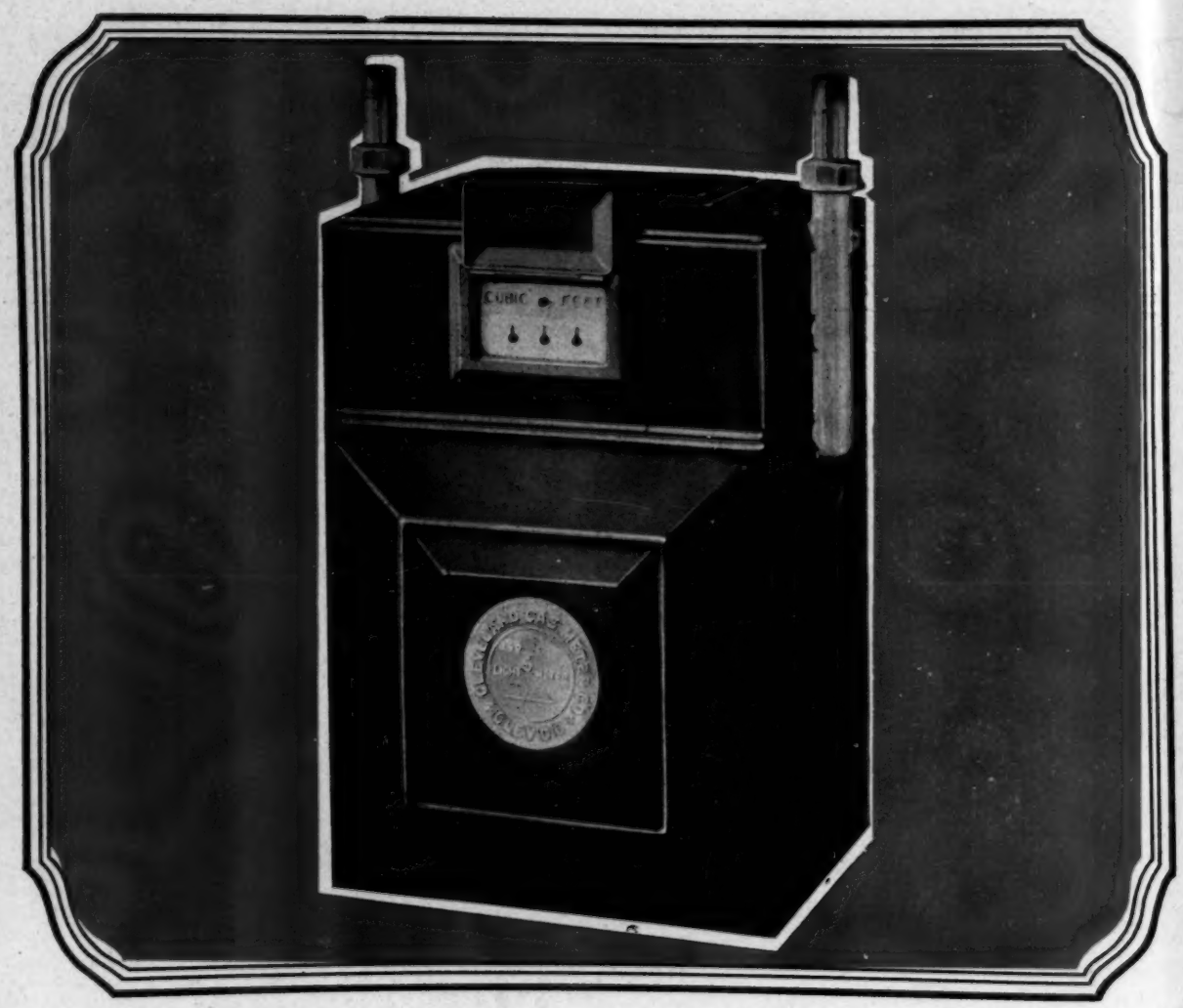

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AMERICAN
GAS JOURNAL

Vol. 121. No. 11 NEW YORK, SEPTEMBER 13, 1924 Whole No. 3481

What Service Means in Industrial Gas

A discusston of a master of prime importance in industrial gas

Arthur Flanders

AN INTRODUCTION

By Edward J. Cooney, Sales and Service Manager, Lowell Gas Light Company, Lowell, Mass.

BEING a staunch exponent of the value of service in the relations of a public utility and its customers, I have been looking forward to reading an article on service as it relates to industrial gas.

Of late we are being favored with many articles on the growing demand for gas for industrial purposes. This activity surely portends good for the future of gas, and the more articles of this nature we can have the better it will be for the industry as a whole.

But we should not overlook some very important facts, the real meaning of which has only recently been fully recognized.

For instance, if, when electricity was first introduced, the reflex and the CEZ lights had been invented, gas for lighting would not have taken the whipping that has been its lot. Of late many gas companies—and the number is being increased daily—are going after gas lighting with a vengeance and they are being most agreeably surprised by the results. When someone invents a gas switch so that gas lights may be turned on and off like electric lights, we will make still greater progress in illumination.

Now that we are getting a faint idea of the importance of gas for industrial purposes do not forget that oil and electric interests are working just as hard and looking with fully as much expectation into the future.

This means that not only must we continue gas engineering research and the designing of better and more efficient equipment, but right from the start we must give SERVICE in industrial gas.

It was with this thought in mind that I asked the industrial gas engineer of our company to write an article for the American Gas Journal on what might aptly be termed industrial gas service. The following is from his pen, and I consider that he has covered the subject in a very concise manner.

Too many times in the past the gas company has taken the attitude that once a prospect has been sold and the installation has been properly made, its full duty is done, and unless the consumer makes a complaint it is good policy just to assume that the installation is functioning properly and let well enough alone.

In Lowell we are trying to get away from this viewpoint. To sell a man the idea that 'If it's done with heat, you can do it better with gas' is of value and is necessary to get the installation made in the first place; but to give the service that will make this idea a reality is of even more importance. To keep the installation installed and to make the consumer a satisfied and constant user of gas, can best be accomplished by regular and intelligent service. The consumer must be made to feel that behind this fuel stands an organization that is constantly striving to give him service such as he could not expect from any other fuel.

The Survey as the First Step

We made our start at achieving this idea of service by making a careful and thorough survey of the local industries, whether or not they were consumers of gas. In each plant the utilization of gas was considered as it existed at the time, and if the equipment used was antiquated or inefficient, proper equipment or changes that would give better results, were recommended. In certain cases where the process itself was wasteful, we worked with the manufacturer to change the process. Where fuels other than gas were being used, we went into the possibilities of substituting gas. If we could offer them a real service, we went after their business; if not, we dropped the matter. for while good salesmanship might get the installation in, unless there was some real justification for its use it could not hope to stay.

Information Card Indexed

All pertinent information about each firm is carefully card indexed. This includes the type of business, person in authority, gas consumption, equipment and uses; other fuels, quantity, equipment, and uses; and prospects for future use of gas. This concluded the preliminary work.

This plan has been further carried out in the following manner: Periodic visits, say at intervals of four to six weeks, made to all plants where gas is being used industrially to any extent, and at longer intervals to plants which are now small users or non-users of gas and where there is some prospect of either increasing the use of gas or introducing it.

Objects of the Visits

The objects of these visits are three-fold: to give service in present equipment; to anticipate any demand for further equipment; and, most important of all, to bring a personal touch into the relations between company and consumer.

The importance of keeping equipment in proper condition is unquestioned. If maximum service is to be obtained from any appliance, it is necessary to give it some care by occasional cleaning, adjusting, and replacement of worn-out parts. If for any reason the manufacturer does not obtain satisfactory service from an appliance, he will, as a rule, not only blame the appliance, but also the fuel, and will be on the lookout for some fuel that will give him the service he needs.

Anticipating Future Business

"For the second point, antcipating future business. By making periodic visits you will keep in sufficiently close contact with the manufacturer, so that if he is planning any increased use of heat you will hear of it in the early stages when his mind will still be open to suggestions.

Knowing his plant and his requirements, once he has reached the point where he is ready to talk business, you will be prepared to come right back with a definite proposal for the equipment he needs. Thus, you can give quick and intelligent service which is bound to be appreciated.

The Personal Contact

"The prime object, of course, of these visits is to introduce a personal friendly feeling between company and consumer. Make the manufacturer feel that you (to him you represent the company) are interested in his business and want him to get the maximum results from his gas equipment. Make him feel that when anything goes wrong the company is ready and anxious to set things right. Should he be getting unsatisfactory results, this will get him to turn to the company with his complaints instead of telling his friends. A satisfied manufacturer is the gas company's best salesman of industrial gas. The manufacturer expects the gas salesman to extol the virtues of gas, but when a fellow manufacturer sings its praises he sits up and takes notice.

In conclusion, too often the gas man takes the attitude that of course it can be done with gas, but the fuel cost will be pretty high compared with some other fuel. If you feel you have to apologize for your fuel, don't try to sell it, for if you don't believe in it yourself, how can you expect to make others believe in it? Sell, and not only sell the manufacturer, but also your own personnel, on the proposition that often fuel cost is only a relatively unimportant point. Talk the idea that with gas you have a fuel that does not require valuable storage space, that gives a temperature control that can be rivalled only by expensive electricity, that can give a reducing, neutral, or oxidizing atmosphere, as desired, in short, preach that for the quality job you have the quality and service fuel.

WHY BE A BUSH LEAGUER?

There are ball players in the minors and in the sub-minors who are destined to remain bush leaguers because they haven't the mental or the physical ability to get into the big leagues. They may try their best and they may use the best available intelligence, and yet they won't make it because they haven't it in them.

The little fellow in business, the business bush leaguer, is not hampered as the fellow is who can't play fast enough ball to get to the top. In business the lack of physical fitness is not necessarily a prohibition. It may not even be a serious handicap. In business the man who cannot think quickly and act automatically may still get to the top. Business is a more deliberate occupation than baseball.

Just because you may be one of the little fellows, doing business back in the locality of small opportunities, is no reason why you must remain there. Study your work and fit yourself to do it better than anyone else around you. You will then get your opportunity to move up. As soon as you have made the first jump, set right about making yourself a better man than the other fellows on that new level.

Getting ahead, moving up from the bush leagues of business into the big-time circuit, is merely a matter of continued improvement. Just keep getting better and better and you will keep going higher and higher. And the further up you get the easier it will be to improve.

One thing you must have that the successful big leaguer has if you are going to get to the top. You must have the love for your business that he has for baseball. No ball player makes the big leagues unless he loves baseball and lives it day in and day out. No business man makes the top unless he loves and lives his business, makes it his main thought in life.

The Future of Gas Is Bright

A review of the year's progress in Michigan

George H. Waring

AT NO time has the gas industry had a brighter outlook than it has at the present. The past ten years have demonstrated to both consumer and investor the necessity and stability of this utility. In spite of the difficulties and necessary increases in rates, the business has continued to grow. With less interference by the Government, the railroads now function so that we are no longer troubled with car shortages. The stabilization of the coal industry has enabled us to procure a dependable quality and quantity of coal. Through various sources the public has learned more of our problems and is more sympathetic than ever before. Investors are seeking our securities, which encourages extensions and improvements of our properties. The courts have come to realize, as shown by recent decisions, that pre-war valuations should no longer prevail, but that unit costs of reproduction should take into consideration present prices of labor and materials. With these vexing problems behind us, we can cheerfully devote our undivided energy and thought to the extension and improvement of our service, together with the efficiency of operation. With this in mind, your executive committee has worked out an interesting and instructive program of subjects for discussion.

House Heating by Gas

House heating by gas is one of the most important subjects being discussed by gas men today, and it should receive the most serious consideration of every gas man. We have it in our power to furnish another great convenience to the public, provided we work out a rate that will be remunerative to the company and not prohibitive to the consumer. Undoubtedly this can be done, and in so doing abate the smoke nuisance and bring one more comfort to the American home.

The Gas Rate

It is generally conceded that our present gas rates, as in most cities in Michigan, are discriminatory, in that small consumers are being served at a loss and at the expense of the larger consumers. This undoubtedly tends to discourage the use of gas by large consumers and retards the rapid growth we would otherwise enjoy. The adoption of the three-part rate would overcome this situation. For various reasons this rate has not been adopted in Michigan, although a modification of it has been applied in seven Michigan cities, where the customer charge is partly included in the first few hundred cubic feet, with no provision for a demand charge. This is a step in the right direction and the time to adopt such a modified rate is when a reduction is being considered.

While there has been a substantial reduction in the cost of coal recently, this reduction in most cases has been more than offset by the decrease in price of coke, so that the net holder cost of gas has shown no decrease due to the lower cost of coal. This situation is unusual, and we hope is only temporary.

Electric and Gas Competition

There seems to be an erroneous idea in the public mind regarding electric and gas competition. This is unfortunate, as there is no such competition. The gas business is relinquishing the power and lighting field to the electric central stations, and is devoting its entire energies to the furnishing of heat for all purposes. The public should understand that, except in a small way, electricity can never compete with gas as a source of heat, when it is remembered that in converting and delivering the heat in a pound of coal electrically from 80 to 90 per cent of the heat is lost; whereas only 25 per cent of the heat of the coal is wasted when converting and delivering same in the form of gas and coke. Hydro-electric current will not change this situation, as it has been demonstrated that water power, including investment charges, is very little cheaper, if any, than power efficiently produced from coal.

Standard Heating Values

Some progressive steps have been taken by several state regulatory bodies in reducing standards of heating values. This has been of greater benefit to the customer than to the utilities, and has resulted indirectly in lower gas bills. Colorado has taken the most progressive step, in that they have authorized utilities to name their own B.t.u. standards. This, of course, will give the greatest possible benefit to the consumer, as the utility will undoubtedly adopt a standard which will be the most economical to the gas consumers.

The Public Service Commission of Washington State issued an order, dated July 26, 1924, in which it declares unequivocally for heating value standards based on local conditions, and states that a careful analysis of the records of the companies at Seattle, Tacoma and Spokane indicated no material increase in consumption due to a reduction in B.t.u. standards. The commission's investigation shows the present

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*The address of the president, at the annual meeting of the Michigan Gas Association.

More Signs of Improvement

Farmers buy more freely—optimism returns

L. W. Allwyn-Schmidt

THE improvement in the general situation indicated by the straightening out of the forecasting curve of our chart during last month has apparently been of sufficient strength to prevent a further decline with a strong promise of a very early movement in an upward direction. Speculation now is ripe whether the improvement will be only short in duration or whether it will lead to a general recovery in all branches of the market.

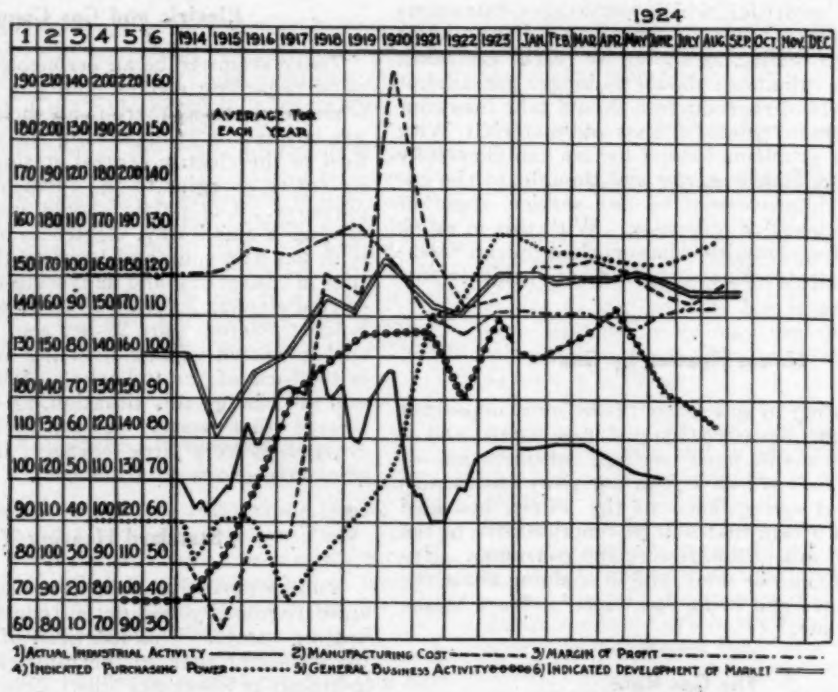
A temporary acceleration of buying is noticed very often during this time of the year, when the farmers are able to spend part of their earnings for purchases which they delayed making during the summer. But such a buying movement frequently dies down again after the most immediate demands have been satisfied. Its duration, in fact, is all a matter of available cash. If the cash reserve in the hands of the purchaser is large, buying will extend over a considerable period. If it is limited, it restricts buying to the essentials, and the buying movement ends immediately after the harvest season. This year conditions seem to be favorable to the farmer. Prices of most leading farm products have increased and there has been up to the present time no marked increase in the cost of manufactured goods. In fact, the tendency in most so-called consumer's goods has been in the opposite direction. Thus the farmer will have more cash available than might have been expected earlier in the year. This will permit him to make improvements in farm property. It will provide means for necessary winter purchases and it will finally leave a small surplus for so-called luxuries or savings. The mail order houses are now feeling the effect of this readjustment of the financial situation and it will not take long before its effects will be also noticed by the other industries in the country.

Buying Movement Should Not Be Overestimated

But care should be taken not to overestimate the strength of the present buying movement. True, the farmer is getting good prices and the purchasing power of his dollar is somewhat higher than before. But the farming communities have passed through bad times for at least one season. So part of the newly-earned money is bound to go for the payment of debts, a form of disbursement which, while helping the financial market, is of no appreciable benefit to the manufacturer or retailer. It will take at least another season of plenty, with satisfactory prices for the farmer, to re-establish the farming sections as a strong factor in the national market.

This, then, lets us expect that the present buying movement, while healthy enough, will not be sufficiently strong to carry the market completely over its present depression. Improvement certainly is at hand, but more substantial support is required

(Continued on page 838)


1924
1 2 3 4 5 6
1914 1915 1916 1917 1918 1919 1920 1921 1922 1923
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEP. OCT. NOV. DEC.
AVERAGE FOR EACH YEAR
1) ACTUAL INDUSTRIAL ACTIVITY
2) MANUFACTURING COST
3) MARGIN OF PROFIT
4) INDICATED PURCHASING POWER
5) GENERAL BUSINESS ACTIVITY
6) INDICATED DEVELOPMENT OF MARKET

GAS MERCHANDISING

Domestic – Industrial

Ignore the Rubber Stamp Orators

Good business times are present for good business men

J. B. Dillon

I MEAN just what I wrote for the caption of this article. My reason for concocting the phraseology is simply this. For more than a year certain people have been whining:

"Well, you have got to expect dull times because this is a Presidential year. You know there is too much uncertainty whether we will get a Democart or a Republican!"

To all of that the answer is "Piffle, Two Poohs and a Couple of Fudges." Now, look here. Isn't it a fact that all of the material used in the making of gas ranges and other gas utensils is abundantly supplied by our own United States? Of course it is! Pray, tell me why we should worry about tariff, imports, exports, etc., when right here in our own country the bulk of the money resides, much of it waiting for some good cause to take it out and let it proclaim itself.

How can it best assert itself than when it buys the best there is in an exchange, and what is better than a gas range for cooking food?

The answer is: Nothing it better, nothing is equal to a gas range for the woman in the kitchen, and on top of that we have canning season ready to announce itself.

Exceptions to the Rule

Business that depends upon importations and exportations for its life must watch the results of tariff, more so than business done locally, but to stop because of fear is downright folly, and that is what too many are doing, listening to the calamity howlers.

The Right Way

While this article is being written, a gas range company has secured the services of a French chef from Hollywood, California, to demonstrate the merits of the company's gas range. He is baking cakes, showing a house filled with ladies just how he does it, and then the cake is sliced and passed around. He emphasizes the fact that to bake a cake as it should be baked one must have the proper kind of heat, and that is best obtained with a gas range. "If you will attend to this requirement and use the recipe I do, you can do as well as I can."

"Who has number 769?"

"I have; I have," chirped the ecstatical woman.

Her name was then laid in icing and one of these delicious cakes given her. Oh, yes, it is Presidential year, all right, but this company is thinking of the fact that people must eat. To eat you must work, said St. Paul, many years ago; therefore, the act of working brings income, and as all must eat, then all must work, and the concerted action will keep Miss Prosperity ever on duty.

An Introspection

My mind reverts to a poem written by the late lamented Ella Wheeler Wilcox, the particular line, reading: "Think health and health will find you as sure as God reigns!"

No, I am not a Christian Scientist, but I do believe that mind over matter oftentimes works a wonderful influence and that many of our imaginary ills can be cured by right thinking and acting.

The aforementioned gas company is carrying out the idea, and that is what every gas utensil dealer should do, and if they did we would have that concerted action which brings plenty of bacon to the larder.

Some Sales Suggestions

Place a coal stove at the left-hand side of your show window, the usual bucket of coal, pile of kindling alongside, and be sure that the floor has some ashes dropped carelessly, the same in front of the grate.

At the right side of the window place a gas range and hang one match on a string from one of the stop cocks. The card sign, placed between the two exhibits, reads:

WHICH

Do you prefer? The worry of coal, kindling and ashes, giving a variable heat; that is, too hot or not hot enough, or heat that is instantaneously adjusted, all of it obtained by the use of one

match, and the movement of the gas valve stem; yet the cost for the splendid gas range's operation is less.

Come in and let us explain. Not necessary that you purchase unless you desire, and then we will arrange terms to suit.

Handling a High Bill Complaint

Only this morning, while I am writing this, a lady came to me and complained that her monthly gas bill was excessive. It was $2.95.

"What is coal worth a ton?" I asked.

"$6.50."

"Don't you think that if you had been using a coal stove you would have burnt half of a ton of coal during the month?"

"Oh, yes, easily a half, or more than that."

"Well, then, you have not only saved money, because I know that you would have burnt $4 worth of coal, but you have had a wonderful cooking heat when you wanted it; no ashes, no kindling, no coal to wrestle with."

She laughed, and then said:

"Oh, you never get tired boosting the gas range, but I can understand what actuates you. It is because they are darlings!"

She stated two truths. I never get tired because, form the bottom of my heart, I really believe—yes, I know—that a gas range is the greatest utensil that the world has produced for cookery, and I stand pat on that assertion and agree that they are "darlings."

Card Signs and Advertising Lines

EXPERTS

Say that unless fruits are properly cooked the canning results will be disappointing. The best heat does the best cooking. That means a Gas Range.

PRESENT AND FUTURE JOYS

There is joy persent when a woman uses a Gas Range for canning. She knows that her labor is lessened because of the easiness in which the heat is obtained and controlled. There is a future joy in store, for she well knows when winter comes she will surprise John with one of his favorite pies, and peaches with cream.

CARE WHEN CANNING

Fruit jars must be properly sterilized before the fruits are placed, and then carefully sealed. Boiling hot water is necessary in both operations. You get it easy and maintain it when you have a Gas Range.

Let us demonstrate. Our terms will fit every purse.

Hundreds of other cards can be "struck off," used as sales slogans in the newspapers and in your show windows. So keep eternally at it and remember that a Presidential year is no different than any other year. All must work, eat and sleep. But when awake assure all that they can do it Cheaper, Better and Quicker with a Gas Range.

When the Guarantee Becomes a Boomerang

A thoughtful consideration of how properly to handle the guarantee

Lester G. Herbert

FOR several years there has been an increasing tendency to guarantee many lines of goods—that is, to offer them on a money-back basis if they do not prove thoroughly satisfactory.

It is naturally reasoned that this expression of confidence on the part of the manufacturer and the retailer is bound to impress the customer and to bring home to him the convincing truth, that in purchasing such goods he runs no risk whatsoever. He is virtually trying out the merchandise at the expense of someone else, and at any time can get back his cash or its equivalent in replacement of the goods.

Principle Good, but Application Must Be Timely

The principle involved remains sound, and we should scarcely want to discard its use in modern business today. Yet it is true that many good things may be abused. Water makes a very desirable drink, but too much of it drowns us. "Fire is an excellent servant," the old maxim reminds us, "but a poor master." Light is a great blessing, but when the time comes we enjoy the soothing and restful character of darkness. In short, we must learn to use good things at the right time and in the right way.

Several illustrations of how not to use the guarantee were recently met and perhaps an account of one will point out a valuable truth in the simplest possible manner.

In this case, a woman went into a store and asked to see a certain cooking utensil. It was shown her, and it was undoubtedly a quality article. She hesitated, however, on account of the price, which seemed to her rather high.

The salesman made no effort whatever to explain the superior quality of the material used in making the article, the sanitary character of its construction

(Continued on page 845)

INDUSTRIAL GAS LESSONS

IF IT'S DONE WITH HEAT YOU CAN DO IT BETTER WITH GAS

Lesson No. 37

Expansion Effect of Heat (continued)

Experiment with Boyle's Law

The law of pressures, known otherwise as Boyle's Law, can be demonstrated and proven experimentally in a very simple manner. The arrangement that is employed for making this experiment is shown in the one accompanying figure.

It consists essentially of a "U" tube which is filled with mercury. At first, when the mercury is added to the tube, both ends remain open and the level in each leg of the tube is the same. Then one end of the tube is closed by using the glass in a Bronson burner. This entraps a certain volume of air between the closed end of the tube and the mercury level. The volume of the gas, which is assumed to be air in this case for the purpose of this exposition, may be considered to be equal to five cubic centimeters.

Construction of the Apparatus

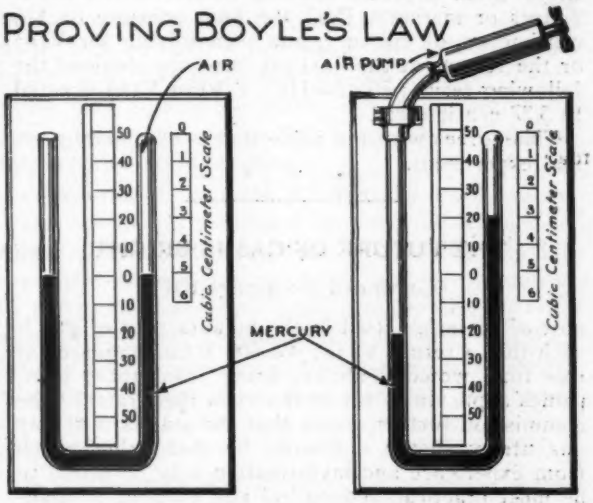
This U tube is then mounted on a board, which also contains a scale. The zero point on this scale is fixed at the mercury level, which is the same in each leg of the "U" tube. The scale is so arranged on the board that the heights of the mercury in the U tube can be readily read off. Another scale is provided alongside the closed leg of the U tube. This scale reads cubic centimeters and from it is told the volume of the air that is imprisoned in the closed leg of the "U" tube.

Pressure Relations

The apparatus as shown in the figure on the left is ready for use in the experiment. The pressure on the mercury in the open leg of the U tube is equal to that of the atmosphere and is assumed to be 76 centimeters of mercury corresponding to 30 inches of mercury in the English system. This pressure is transmitted equally in all directions by the liquid mercury, with the result that the pressure on the five cubic centimeters of air in the closed leg of the U tube is exactly equal to the atmospheric pressure on the level of mercury in the open leg of the U tube. Hence the volume of five cubic centimeters, read off the scale, is to be considered as the volume of the air at 76 centimeters mercury pressure, which has been assumed to be the atmospheric pressure.

Running the Experiment

The temperature during the course in this experiment remains constant. At the right of the accompanying figure is shown the apparatus ready for the experiment. A rubber tube is fastened to the open leg of the U tube. A small pump of the variety used to inflate bicycle tires is connected to the other end of the rubber tube. By working the pump the pressure on the level of mercury in the open leg of the U tube is increased. This causes the level of the volume of mercury in the open leg of the U tube to fall, with a corresponding rise of the level of mercury in the closed leg of the U tube.



VOLUME DECREASES AS PRESSURE INCREASES AND VICE VERSA

The extent of this change in the level between the two columns of mercury will depend, of course, on the amount of pressure that is applied by means of the bicycle pump to the surface of mercury in the open leg of the U tube. After sufficient pressure has been applied materially to effect the levels of the mercury columns, a pinch cock is used to close the rubber tube so as to prevent the pressure from leaking out. The bicycle pump can then be removed.

After the mercury levels have become stationary, the difference between the levels is read off on the center scale. This difference is merely the sum of the height of the mercury level in the closed leg of the U tube above the zero point on the scale and the depth of the mercury level in the open end of the U tube below zero point on the same scale.

Pressure in Assumed Case

For example, in this case it will be seen that this difference is equal to 40 centimeters. This, then, means that the pressure on the volume of air imprisoned in the closed leg of the U tube is equal to 40 plus 76, or 116 centimeters of mercury. The volume of this imprisoned and compressed air is now read off the scale to the right of the closed leg of the U tube and this is seen to be 3.25 cubic centimeters.

The formula which was developed by Boyle to express the change that takes place in the volume of the gas as the pressure is varied is, as has been indicated, as follows: $P(a)V(a)=P(b)V(b)$. By substituting in this formula the values corresponding to the various terms therein as follows: V(a) the original volume of the air or five cubic centimeters, P(a) the original pressure on this volume or 76 centimeters of mercury, P(b) the final pressure or 116 centimeters of mercury, and then solving for V(b) or the volume at the final pressure, we obtained the following result: $76\times5=116\times V(b)$ or V(b) is equal to 3.27 centimeters.

This agrees with the value that is obtained by actual experiment.

THE FUTURE OF GAS IS BRIGHT

(Continued from page 831)

cost of materials used in the manufacture of gas is such that a return to the old 600 B.t.u. standards at this time would doubtless bring from these companies applications for increases in their rates. The commission further states that the standard of any gas utility should ordinarily be that value which from experience and investigation may be found to be most practical, economical and efficient to manufacture and to supply to its customers to their satisfaction.

The Association

The Michigan Gas Association has completed its thirty-second year of honorable, active work, having contributed much to the nation's gas literature. There is an esprit de corps in the Michigan Gas Association that would preclude any action that might lose the identity of this association.

It is with profound regret and sorrow that I announce the passing of our most honored member and dean of the Michigan association, Henry W. Douglas, of Ann Arbor. I know that it would be his wish that we carry on the work of the association that he has so ably forwarded. I suggest that during our deliberations suitable resolutions be adopted that will express our feelings in the loss of our loyal friend and associate.

I wish to take this opportunity of thanking the various committees, the authors of the papers and the efficient secretary in particular, for the splendid co-operation, all of which has made by work both light and pleasurable.

The success of this meeting is now in your hands.

THE STORMOGUIDE

The Taylor Instrument Company, Rochester, N. Y., has just announced the Stormoguide, which they term "a weather counsellor for golfers and all." In their announcement they state:

"The Stormoguide is a simplified weather forecaster—a veritable clock of the air.

"No meteorological or text knowledge necessary—no puzzling words 'rain,' 'change,' 'stormy'—complete forecasts appear etched on the dial in clear, easily read lettering.

"It enables scheduling business plans or pleasures by 12 to 24 hours advance weather information."

GAS MACHINE SINGES TWO MILES OF CLOTH IN ONE HOUR

When a woven fabric comes from the loom, its surface is covered with fine hairs, fluff and nap, which must be removed before the cloth can be dyed or printed, for the rough surface will not take an even color or a clear line.

Since time immemorial, cloth has been smoothed by singeing, either by running it through a flame and immersing it in water to put out sparks, or by the use of hot plates and rollers.

A recently developed application of gas heat to the singeing process has, it is said, so greatly improved the singeing of cloth that the use of coal-fired machines is rapidly being given up.

The gas flame is ready for use the moment it is lighted, and gas-heated rollers can be raised to the required temperature of fourteen hundred degrees in twenty minutes, as against the four or five hours needed to heat similar rollers with a coal fire.

Cloth can be run through the gas singeing machine at the rate of two hundred feet a minute, or more than two miles an hour, and automatic control of the heat produces more uniform results than were possible with the use of coal.

As The Journal Views It

WHAT HISTORY TEACHES US

The gas man has been persistently assailed with adverse comparison between the progress that he has made in his industry, and what the electrical man has accomplished in his. In fact, this practice has been carried out to such a point that the gas man can rightly object to bald-faced statements and derogatory remarks that are made without due consideration of the facts. Comparing gas and electricity has been worked to the point where it has become a real bore.

The gas man and the gas industry do not desire to avoid criticism, provided that this criticism is constructive. Furthermore, they are not afraid of being compared with other industries, but they do object to a continual admonition to look at the electrical industry and see what it is doing—how much more than the gas industry. It may be a fact that the electrical industry has shown greater progress than the gas industry, but there are certain mitigating circumstances which ought to be taken into consideration and which ought to be brought to the attention of those who are so quick to find fault with what the gas industry has done in comparison with the progress that has been made in other industries.

Of course, it must not be misunderstood that the gas industry seeks to deny that in certain respects its progress has been slow in comparison with others, but in looking over the history of gas perhaps there can be derived therefrom an insight as to just why there has in certain cases been in the past so lamentable a lack of progress in gas.

History teaches us to understand the conditions that exist at the present time. This applies to other situations and other relations besides those that surround the gas industry.

Gas has always been a mysterious substance. In the very earliest times, the natural gas escaping from the earth was thought to be endowed with supernatural powers and was used as a means of influencing the people through pseudo-religious mysteries and miracles. Among these may be mentioned the Oracle at Delphi, whose advice was always given in a manner bound to redound to its credit, no matter what the outcome of the undertaking was. The priestess delivering the article was partially overcome by the escaping natural gas.

Artificial gas was first experimented with by alchemists, the forerunners of the chemists and physicists, who were looking for the "Philosopher's Stone"—that wonderful means of changing all they touched into gold—and the Elixir of Life, that miraculous fluid, to quaff which meant immortality. The name "gas" was given to it by one of these alchemists, and signified a spirit, a metaphysical substance, and when gas was first proposed as a lighting medium the world laughed.

Of course, it has acted similarly in many other cases, but in this particular instance the laugh was tinged with a certain amount of fear—the original mysteries surrounding gas being still in the minds of the people—and they were actually afraid of it, even though they ridiculed it. Even after gas had been in use for quite some time, people were afraid to go near it, and it has been said they were even afraid to touch the pipes through which it was conducted.

Is it, therefore, any wonder that progress in the gas industry, which was originally rooted in the deepest mystery, should have been so slow? Is it any marvel that today there may exist a trace of this original fear and superstition regarding gas, in some way related with reluctance on the part of many people to view it as they do electricity, or other inventions which are even more of a marvelous character?

It is not intended to write a brief to explain why progress has been slow in the gas industry, or to condone such a condition, but when comparing electricity with gas it must be remembered that electricity was discovered, and its applications were devised, at a time when the mystery and the superstition had been driven out of chemistry and when the

people had reached a state of mind in which they could view the wonders that men performed with the forces of nature, without assigning to them supernatural or mysterious character. On the other hand, when gas was first made, people were by no means so far advanced and were still under the influence of the alchemistic and mystical teachings with which early men of science inevitably surrounded the facts that they discovered in their attempts to attain the impossible!

The history of the gas business is therefore a peculiar one. It may be that there is still an unconscious resistance in the minds of the people against gas. If this is true, it would not excite any wonder, considering its antecedents. Gas must develop. It must progress in spite of this.

Gas men must overcome this resistance, this reluctance on the part of prospective customers to consider gas as a fuel in place of others that are now used. They must approach the matter in a practical manner, and when ridiculed and laughed at—just as the eminent Sir Humphrey Davy laughed at the first gas entrepreneur, Winsor, who was working with might and main to establish the first gas company in the world, and who answered Sir Humphrey that he hoped to see, within his time, gas holders as large as the dome of St. Paul's in London—let them remember the words of this great gas man and continue to work towards the attainment of our goal, the use of gas wherever heat is required.

MORE SIGNS OF IMPROVEMENT IN INDUSTRY

(Continued from page 832)

before the market can return to the heights of prosperity which it enjoyed before the downward movement started nine months ago.

Little Fear for a Backsliding

On the other hand, there is little cause now to fear a backsliding. In fact, everything is in favor of a steady, if slow, improvement in the demand for merchandise from all sections of the country, which most certainly will continue right up to the Christmas season. The new purchase movement is likely to cover almost all branches of the nation's industries.

We have cautioned all along against an unguarded expansion of industrial equipment. What we have said early this year still holds good at the present time. Since the end of the war, manufacturing facilities have considerably widened, while buying has continued upon practically the same level. We have today, therefore, all the industrial equipment that we can make use of. This conviction is gaining more and more ground with manufacturers, with the result that comparatively little will be added to the nation's industrial tools, which, in turn, limits the production of such equipment to normal replacement business. This, even at a favorable rate, can not exceed more than about ten per cent of its present value.

It explains why in the face of the general recovery of the consumer's market there is still noticeable a slackness in the so-called key industries, as the steel industry, for instance. Improvement in those industries may still be delayed for some time until the market has gained sufficient strength to justify renewed expansion.

Present Recovery Somewhat Early

The present recovery of the market has appeared somewhat earlier during the year than might have been expected. This is rather a good sign, because it will help the business activity in many industrial branches which, if it had come later, might have had to wait until next spring for their own share in the new business that will now flow into the market.

Higher prices for farm products, of course, cannot be obtained without an increase in the cost of living. It is doubtful, however, whether this increase will be large enough seriously to impair the purchasing power of the wage-earner. Thus far the effect of higher living cost has been balanced by a decrease in the price of other commodities. The future development of the market depends very largely upon the price situation. If food prices should by chance continue to increase during the winter, we may expect a slight decline in the consumer's purchasing ability. The change, however, would have to be very considerable before it can seriously react upon the market. From this standpoint, when all the uncertainties of the situation are thus taken into consideration, there remains, nevertheless, sufficient cause to maintain that a definite change has come about in the general market atmosphere. The spirit of depression which has governed it almost since the beginning of the present year has been replaced by one of hope. We are emerging from a severe attack of nerves ready optimistically to take hold of any favorable opportunity that may offer itself.

WHEN THE GAS COMPANY TAKES YOUR WIFE'S PART

"Build your kitchen for Mrs. Jones, not Mr. Jones," is the advice of the manufactured gas industry to architects. The most progressive gas companies are following their own advice by endeavoring, as far as gas appliances are concerned, to make the "domestic workshop," so-called, as modern and efficient as an up-to-date office or factory. Some of them are employing women in order to get the woman's point of view.

The "lay-out" of the kitchen may mean the saving of countless steps for the housewife who does her own cooking. For example, the currants, flour, sugar, etc., should be kept in the cupboard directly behind the cook as she faces the light at the center table, with the gas range on her left side.

Catechism of Central Station Gas Engineering in the United States

Installment No. 36

(Continued from last week)

Form of Burner

The form of burner used varies for different kinds of gas, as explained in the answer to question No. 197. In some photometers the vertical pipe on which the burner is mounted is fixed, while in others it is movable and can be brought to, and held in, the proper position by means of a long thumbscrew working through a fixed support on the table into a nut on the burner base. This burner pipe is fitted with two stop cocks, the lower one of the two being very carefully made and provided with a lever handle which is moved by a screw so as to secure a close adjustment. The upper one is an ordinary stop cock by which the gas can be turned on or off without disturbing the adjustment of the lower one.

Standards Employed

Various standards of light are employed in photometric work, but only the arrangement of the photometer which provides for the use of candles will be described. It is customary to employ two candles, which are placed in a holder suspended by knife edges from the end of the beam of a delicate and accurate balance which is nearest the disc. The holder is constructd so that the candles are on opposite sides of and equally distant from the continuation of the center line of the bar. The candles are in some cases held by narrow metal bands in which they can be firmly clamped, while in others they are held in deep cylindrical cups, just large enough in diameter to permit the candles to slip into them, and with adjustable false bottoms, by raising which the flames can be readjusted to the proper height as the candles burn away. From the middle of the cross-piece joining the two candle supports is hung a pan for the reception of the weight by which is determined the rate of burning of the candles during a test. On a knife edge at the other end of the beam hangs another pan into which are put small weights or shot to balance the candles. The candle balance is often mounted so that it can be moved back and forth along the line of the bar, so that the candle flames can always be brought to just the proper position with reference to the middle of the bar and the gas flame. Balances with arms of equal length are to be preferred to those with arms of unequal lengths. Care should be taken to keep the balance in good condition so that it will be sensitive and swing with a steady motion. A pointer attached to the beam at the fulcrum swings over a graduated arc and is ovet the center line when the beam is horizontal and the candles just balanced by the weight at the other end.

The Meter

The meter is a small, wet meter having a large dial, the hand on which makes one complete revolution for each twelfth of a foot passed. This dial is divided into five principal divisions and each one of these is subdivided into ten small divisions. The large divisions correspond to 1/60 of a foot. A smaller dial divided into twelve equal divisions, each corresponding to one complete revolution of the large hand, is also provided on the face of the meter. Fastened to the side of the meter is a small box with a glass front on which is a mark showing the water line, and with an opening on top through which water can be added to bring it up to the proper height. This opening is closed by a screw cap. On top of the meter is a small clock, the hand of which travels around the same center as the large hand of the meter and makes a complete revolution of the dial in one minute. When the hands of the meter and the clock travel at the same speed the gas is passing exactly at the rate of 5 feet per hour, and any other rate of burning can be determined by observing the difference between the speed of the two hands. The clock is worked by a weight and wound by means of a cord. It can be started and stopped as desired by means of a slide. When it is going, it rings a bell when the hand passes the division at the extreme top of the dial. A cord is arranged so that the clock can be started by the observer while standing at the candle end of the table.

Auxiliary Apparatus

Through an opening in the side of the meter a thermometer is inserted vertically into the gas space so that the temperature of the gas passing out of the meter can be noted.

The meter, wet governor and pressure gauge are set on the table back of the solid screen placed behind the burner, and the gas connections are made so that the gas coming from the supply passes first through the dry governor, then to the meter, then to the balanced wet governor and then to the burner. The pressure gauge is provided with four connections, so that the pressure existing at any one of four points can be taken as desired.

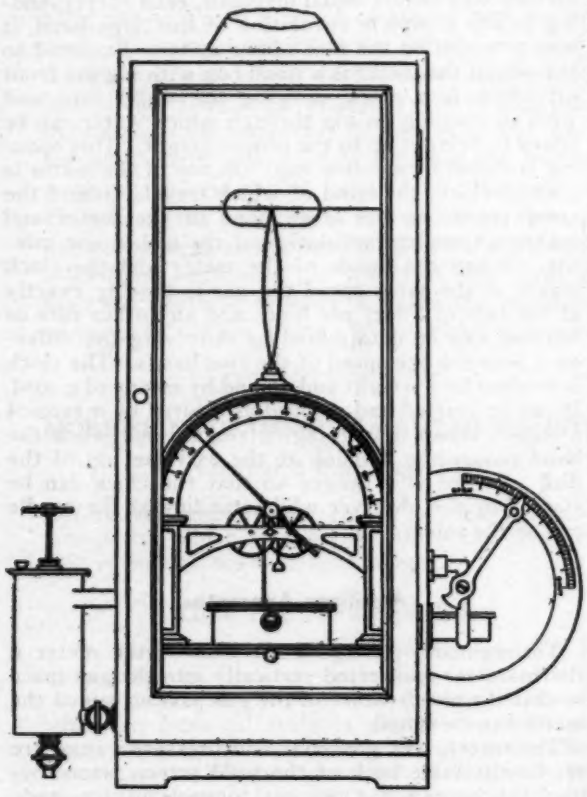
The photometer should be placed in a room that can be kept well ventilated without drafts and from which all outside light can be excluded when making a test. The walls of this room should be painted a

dull black to prevent any reflection of light from them to the disc.

The Jet Photometer

201. Give a description, illustrated with sketches, of some form of Jet Photometer used for determining the candle power of gas, and give your opinion as to the reliability of the results obtained by the use of such an instrument.

Ans. The Improved Lowe Jet Photometer is an example of the type of these photometers, which determines the candle power of gas from the pressure required to maintain at a fixed height a flame produced by burning the gas through an orifice of a definite size. It consists essentially of a King's pressure gauge on top of which is fixed a small steatite tip, with a fine circular orifice, through which the gas is burned as it issues from the gas space of the gauge. The gauge is mounted in a wooden case



The Lowe Jet Photometer

with a glass door. On the back of the case a horizontal line is marked at a height of 7 in. above the top of the tip and a piece of colored glass on the door has its top edge at the same height. A dry governor is placed in front of the stop cock on the gas pipe leading to the gauge, so that the pressure on the supply side of the stop cock is kept constant. The stop cock has a long lever handle, the free end of which moves over a scale marked on a quadrant attached to the side of the case, as shown on the cut. The gauge is made so as to give the least possible friction, and this in connection with the close adjustment of the supply of gas, made possible by the long handle of the stop cock, enables the height of the flame to be regulated so that its tip is exactly in line with the marks on the door and the back of the case, as determined by sighting from one line to the other.

Improvements in the Apparatus

In the old form of these photometers the scale on the gauge is graduated to hundredths of an inch, and the candle power, corresponding to the pressure which exists when the flame is adjusted to the proper height, is obtained from a table furnished with the instrument, either separately or in the form of an auxiliary scale placed below the pressure scale and properly tied into it. In the more modern forms there is no pressure scale as such, the semicircular scale over which the pointed of the gauge travels being graduated to give the candle power by direct reading, as shown on the accompanying cut.

The Pressure Gauge

It is, of course, important that the gauge should show the correct pressure, and to do this the water line must be maintained at the proper level at all times. The adjustment of the water line is provided for by a small cylindrical tank mounted on the side of the case opposite to that on which the gas cock is placed. This tank, which communicates with the gauge by a connecting pipe, is provided with a piston, and the space below this piston being filled with water, the water line of the gauge can be readily adjusted to the proper level by moving the piston up or down according as the water is above or below the proper point.

The Jones Jet Photometer

Another style of jet photometer, of which the Jones Jet is an example, determines the candle power of the gas from the varying height of a flame produced by burning the gas through a small orifice at a constant rate or at a constant pressure. The Jones Jet consists of a steatite tip with a fine circular orifice to which the gas is supplied by a volumetric governor, and the candle power scale is marked on a colored glass chimney surrounding the flame.

If illuminating gas could be made at all times of a uniform composition, a jet photometer if once correctly adjusted would give fairly accurate absolute candle-power results. Since it is not possible to make such gas of a perfectly uniform composition, such a photometer cannot be depended upon to give absolute results that are accurate, as even when the tip is of the proper size for the kind of gas to be tested, and the readings are correct when the gas has

a certain composition, any change in this composition will change the readings even though the illuminating value remains the same. It is obviously entirely out of the question to attempt, as is sometimes done, to use the same jet photometer without change of tip for both coal gas and carburetted water gas, or a mixture of coal gas and carburetted water gas.

The true field of the jet photometer is to furnish a rapid method of obtaining frequent tests of candle power than can be compared with one another and thus afford a check upon manufacturing results that cannot be obtained by comparatively infrequent tests made upon a bar photometer. But even when used in this way the reading of a jet photometer should be compared every day or two with the candle power as shown by a bar photometer in order to be certain that, through change in composition of the gas or in the size of the orifice in the tip, these readings do not vary too much from the actual candle power of the gas.

Section IV.—Distribution System and Consumers' Appliances

Street Mains

Advantages of Cast Iron and Wrought Iron Pipes

202. What are the respective advantages and disadvantages of cast and wrought iron pipes for use as gas mains?

Ans. The advantages of cast iron, as compared with wrought iron pipe, for use as gas mains, are greater ability to withstand any corrosive action of the soil in which it is laid, and consequent longer life, greater thickness for equivalent internal diameters, giving a better joint for service connections tapped directly into the main, and, in sizes from 6 in. to 30 in. inclusive in diameter, smaller first cost. The disadvantages of cast-iron pipe are, the necessity for a greater number of joints of a form more difficult to make tight originally, and to keep tight throughout the life of the pipe, than is the form of joint used in wrought iron pipe, and the brittleness of cast iron, which renders it liable to break under shocks from extraordinary traffic on the street in which it is laid, or from strains thrown upon it through subsdences, due either to a disturbance of its foundation or to this foundation being originally insecure. The advantages and disadvantages of wrought iron pipe as compared with cast iron are of course the converse of the above.

The Life of the Cast Iron Pipe

In good soils cast iron will last indefinitely and even under the worst conditions it will have a life of some years. Comparatively little wrought iron pipe has been used for gas mains and none of this dates back far enough to furnish conclusive data as to the number of years that can be safely counted upon as the life, under ordinary gas distribution conditions, of such pipe when covered with a good protective covering. Experience with coated services shows, however, that when the conditions are at all bad, wrought iron corrodes much faster than cast iron, and that even under comparatively favorable conditions a very perfect coating is necessary to make a life of twenty to thirty years reasonably certain.

Importance of Pipe Thickness

The greater thickness of cast-iron pipes permits the securing of sufficient depth of thread to make a good screw joint in the wall of the pipe itself, so that there is no necessity for using the service clips or saddles, without which a good joint cannot be obtained with wrought iron pipe. The use of these clips adds not only to the cost of the services but also to the opportunity for leakage at the service connections.

Use of Wrought Iron Pipe

In the smaller sizes, 3 in. and 4 in., however, wrought iron pipe can be laid, under normal conditions of price, more cheaply than cast-iron pipe, and in small towns or the residential suburbs of large cities, where the soil is good, the services will never average less than 50 ft. apart and the probable consumption will never exceed the capacity of the above sizes, the advantages of wrought iron outweigh the disadvantage of possibly shorter life, and it is good practice to use it.

Another place where the use of wrought iron is advantageous is in the case of a line to be laid up a hill where the ditch would have to be blasted out of rock, and where there is an opportunity to use a ditch already made for a sewer or a water pipe. A line of cast-iron pipe could not be maintained in such a location, while the wrought iron pipe is strong enough not to be broken by any settling, and the line being laid on a slope there is little danger of its becoming trapped.

Wrought iron pipe is also preferable for use on bridges and in other exposed places.

The Size of Cast Iron Pipe

203. What do you consider the smallest size of cast-iron pipe which it is advisable to lay for street mains, and what weight per foot or per length of 12 feet do you consider suitable for this size of pipe?

Ans. It is not good practice to lay any cast-iron

pipe of a smaller diameter than 4 in., except in localities where it is reasonably certain that a smaller pipe will be able to deliver for an indefinite period, without undue loss of pressure, all the gas required in the territory to be supplied.

A good average weight for 4 in. cast-iron pipe is 220 lbs. per length of 12 feet, or about 18 lbs. per foot. For use in very small towns lighter pipe can be employed, while in some locations in large cities heavier pipe is needed, but for general use the above is, as stated, a good average weight.

Joints Used in Cast Iron Pipe

204. Give a list of the various joints employed for connecting together the separate lengths of cast-iron gas pipes, and state their respective advantages.

Ans. In England and on the continent of Europe a great variety of joints for cast-iron pipe have been devised and to a certain extent used. These include movable flange joints, clip joints, collar joints, screwed joints, bell and spigot joints in which the joint is made by means of a vulcanized rubber ring, and bored and turned joints, as well as the fixed flange joints, bell and spigot joints of lead or cement and ball and socket joints, which are practically the only joints used in this country, and are, therefore, the only ones considered in this answer.

The Flange Joint

Flange joints allow of the easy removal, when desired, of any one of the various pieces of pipe. They are, however, very rigid, and their use is confined to lines of pipe above ground and at the works. On long, straight lines of flanged pipe one or more expansion joints should be provided to relieve the pipe of the strains that would be thrown upon it by its expansion and contraction under the influence of changes in temperature.

Ball and socket joints are expensive and are used only for lines where great flexibility is necessary, as in laying pipes under water.

For ordinary street main work, bell and spigot joints are used almost exclusively in this country. The joints are made sometimes with lead and sometimes with cement.

The lead joint, while as a rule more expensive than the cement joint, has the advantages of being more easily cut out, more easily repaired, and of allowing the pipes to expand and contract, under the influences of changes of temperature, without fracture, since the lengths can move in the joints.

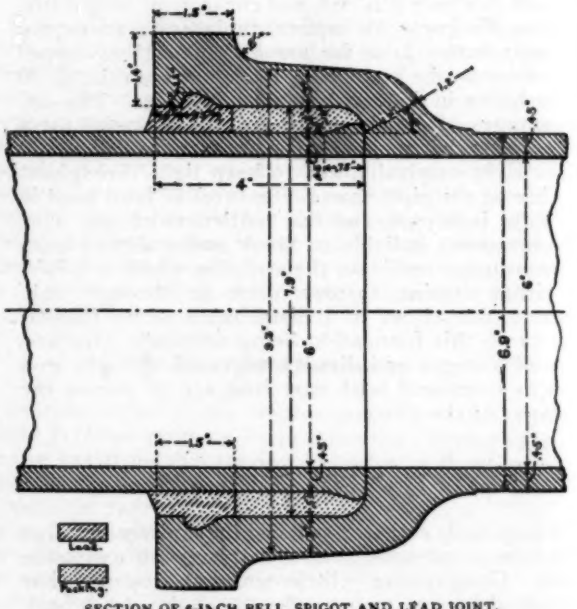
The Cement Joint

On the other hand, the cement joint is cheaper and more rigid than the lead joint, and when properly made will remain tight under almost any possible conditions. A line of pipe laid with cement joints if exposed to changes of temperature will not show small leaks at the joints as will one laid with lead joints, but, on the other hand, it is more liable to fracture.

In most instances the choice between lead and cement joints is determined by the relative disadvantages of a number of small leaks and of one large leak, which latter will be more quickly detected, but, because of allowing more gas to leak in a given time, is more liable to cause damage. In one large city lead joints are used in the heart of the city, where gas from a leak might collect in closed spaces, and cement joints are used in the outskirts, where the conditions are more favorable for the gas from a leak passing away into the open air without forming an explosive mixture in a confined space. A frequent practice is to lay the pipes with cement joints, but at intervals of from six to twelve length to put in a lead joint to act as an expansion joint—the location being marked and noted, and the lead joint occasionally examined.

Standard Bell Spigot and Lead Joint

205. Give a description, illustrated with a sketch of a longitudinal section of both spigot and hub showing outside diameter of spigot, all dimensions of the hub or bell, the shape of the lead groove in the bell, and the depth and finished shape of the lead, of the making of a lead joint in a 6 in. cast-iron main. Give also the amount of lead and packing used and the length of time that should be required to do the work.



SECTION OF 6-INCH BELL, SPIGOT AND LEAD JOINT. AMERICAN GAS LIGHT ASSOCIATION STANDARD.

(Thirty-eighth Installment Next Week)

*The Benzol Content of Gas

Its determination by means of activated charcoal

Aloys Schmolke

(The article that follows and that is translated from the German journal, Das Gas und Wasserfach, is concerned with a simplified method of determining the benzol content of gas by means of activated charcoal. Activated charcoal is a product that was originally developed by the Badische Co. and that has been used on a commercial scale with considerable success for the extraction of vapors from gases. Its use in the analysis of coal gas to determine the percentage of benzol contained therein is claimed to simplify the process to a considerable extent and this method will be interesting to American gas men who are concerned with recovering benzol and other similar constituents that are contained in coal gas. —Trans.)

THE percentage of benzol that is obtained from coal gas varies in accordance with the character of the coal, the construction of the retort and heating oven employed and the efficiency of the benzol plant also changes, although the same coal is used and is coked under exactly the same operating conditions. This variation is brought about by the differences that take place in the manner in which the operation of the coking plant is carried out. For this reason and for others as well it is necessary to watch the benzene content of the gas and to be able to determine it without difficulty and with speed.

Advantages of the Activated Charcoal Method

Before the activated charcoal method of determining the benzene content of gas was introduced, considerable trouble was experienced in making this analysis. But the new method, which combines in it both accuracy and simplicity, has overcome this difficulty. Various improvements have been made in this method since it was first used, such as the introduction of superheated steam to drive out the benzene that has been absorbed by the activated charcoal, as well as changes in the construction of the apparatus employed. The method which is described below is a still more simplified version of the original activated-carbon process.

Apparatus Required in Process

The different parts of apparatus that are required for carrying out this process are as follows: An absorption tube, a vessel for conducting evaporation and distillation, superheater, an air bath, a condenser and a measuring burette. These pieces of apparatus are all of simple construction and can be obtained from any apparatus house. A cylindrical shell is fastened to a support and is used as a heating device. This shell is divided into two parts in the direction of its longitudinal axis. The posterior half is fastened to the support and the anterior half is easily fastened to the posterior half by means of four suitable fasteners. This shell serves as the air bath and is connected with the steam superheater at the top part and the flask in which steam is generated at the lower part; a connection is also made with the absorption flask or tube. This arrangement makes it possible to carry out the operation with just one source of heat, an ordinary Bunsen burner, which is fastened into the lower end of the cylindrical shell. This burner is used for generating the steam, for superheating the steam and for heating the absorption tube to drive out the absorbed substance after the analysis has been completed.

The Steam Generator

The vessel in which the steam is generated is an ordinary flask on which a distilling head is placed and used as a superheater. In this arrangement not only is the water, which is held in mechanical suspension with the steam, separated, but the first step in the superheating of the steam takes place. The outlet tube of the distilling head is connected with a nozzle provided with a flange that is located underneath it. The nozzle is led into a tube provided with a three-way cock and furnished with a corresponding flange so that the two flanges come into direct contact with one another. The union between the two flanges is made air tight by the interposition of a properly cut piece of asbestos paper which has previously been slightly wetted. The two halves of the flange joint are then tightly fastened together in some suitable manner.

The Absorption Flask

The absorption vessel is composed of an inner and outer cylinder, both of which are connected together by means of a conical-shaped ground seal, that is, one part fits tightly into the other, the connection between the two being in the form of a ground glass connection. Inlet and outlet tubes are connected at the same point. The part that fits into the ground connection may be turned sideways during the process of weighing so as not to interfere with the operation. The space, which is found between the two cylinders of the absorption vessel, is utilized as a superheater. In this annular space the second stage of the superheating of the steam takes place. The absorption flask itself is fastened in an air-tight flask, which is provided with two openings. One of these is used for conducting the coal gas into the apparatus and the other for leading it away after absorption during the operation. Then again, after the absorption has been completed and the absorbed benzol is being driven out of the activated charcoal, these openings are also used for the introduction of steam and the removal of the benzol carried along by the steam after the latter has passed through the activated charcoal.

Furthermore, from the point at which the connection is made between the parts of the absorption vessel, another connection leads to the coil cooler, which is held in a vertical position, and is tightly fastened to the support which holds the rest of the apparatus. This connecting tube is provided with a three-way connection and a valve, through which the gas which is to be tested is admitted into the apparatus. The end of the cooler is connected with a measuring burette. The absorption flask, the connecting parts and tubes, are made of glass or metal. When metal is used in their construction, the inlet tube which leads the distillate into the cooler is provided with a water seal, through which the water used in the cooler is introduced.

Making the Analysis

At the beginning of the experiment the burner is lighted. In order to remove the benzene from the coal gas sample, the latter is led through the three-way valve to the absorption vessel, in which it enters at the top, passes through the column of activated charcoal, which is found in a long, narrow tube. The gas then enters the space which separates the inner and outer cylinders of the absorption vessel and leaves through the second of the outlet connections which branch off from the point at which the inner and outer tubes are connected together by a ground-glass joint. The gas then passes through the lower three-way valve and is then sent to a meter for measurement.

The Gas Sample

The speed of travel of the current of gas during this operation is approximately 250 liters per hour. The absorption flask holds approximately fifty grams of activated charcoal, which is able to absorb from 20 to 25% of its weight of benzal. Hence approximately 300 liters of the gas of the character commonly manufactured in coke oven plants or in gas retorts is used in the test. This gas contains from twenty to thirty grams of light oil per cubic meter before it is sent to the benzene washing plant. The gas, after passing through the benzene washing plant, may also be tested for its benzol content, and in this case the sample of gas used is increased to one thousand liters.

If the quantity of the absorbed light oil is to be determined by direct weighing, then it is necessary to pass the gas first through a container holding calcium chloride in order to remove its moisture. The drying installation generally consists of a system in which there are included a calcium chloride tube, a vessel containing a cold saturated solution of picric acid and finally a tube filled with cotton wadding through which the dry gas is filtered to remove any solid particles that it may contain. When the gas is thoroughly dried in this fashion and then analyzed, the results obtained by direct weighing of the benzene absorbed by the activated charcoal and those obtained by driving off the benzene from the charcoal by means of steam and then weighing the same, agree with each other perfectly.

Removal of the Benzene from the Charcoal

There are in reality three steps involved in the driving out of the benzol from the activated charcoal in which it is absorbed. The first steps consist in the use of steam, which revivifies the charcoal so that it can exert its absorptive function with the same degree of efficiency as at the outset. The second step consists in the use of an air bath for heating the freely suspended absorption vessel and the last step consists in the drying of he activaed charcoal by means of superheated steam.

Process After Benzene Is Absorbed

After the benzene has been absorbed and the increase in weight has been determined, the flask in which steam is produced is filled half-full of water and connection is made with the heating arrangement. Then the three-way valve at the lower part of the apparatus is connected with the steam generator and the three-way valve at the top is placed in such a position that connection is made with the cooler. The gas burner is lighted and the water is brought to the boiling point. The steam that comes from this flask rises in the heating device and in rising through the same it slowly heats up the absorption flask and the superheater. The burner is adjusted so that the final temperature secured is about 200 degrees C., which can be read off on a thermometer which is inserted in the topmost part of the heating chamber. At the middle part of the same, where the superheater is located, the temperature is somewhat higher. Just as soon as steam comes out of the cooler, the three-way cock at the lower part of the apparatus is set in such a fashion that the steam is passed through the activated charcoal, which has absorbed the benzol from the coal gas.

Before the steam reaches the charcoal tube, the water which is held in mechanical suspension in the vapor is partly removed by the superheating which takes place in the distilling head—referred to above as the first stage of the superheating—and partly by passing through the annular space between the two cylinders of the absorption vessel, which is also referred to above as the second stage in the superheating process. The steam in passing through the activated charcoal drives out the absorbed light oil.

Further Steps in the Process

The mixture of water and light oil vapors is condensed in the cooler and the light oil is collected in the measuring burette over a column of water and the volume of the same is measured. The analysis may also be conducted at a considerably lower temperature, viz., 140 degrees C., and the charcoal may be obtained in a dry condition without the need later of passing hot air or gas through it.

Characteristics of the Process

It is claimed that the method of determining the percentage of benzol in coal gas by means of activated charcoal has found much favor among those who have used it as a regular control test in the daily operation of the gas plant. The results are accurate and the production of benzene from the works has been found to agree very well with the figures that were obtained by the analysis of the coal gas.

If the reader is interested in the capacity of activated charcoal in absorbing different gases that are commonly found in coal gas, he is referred to the work done on this subject by Ruff, called "The Characteristics of Activated Charcoal." There he will find described the manner in which activated charcoal acts toward gases such is nitrogen, carbon monoxide, ammonia, etc., at various temperatures. He will also find there a discussion of the influence of tar on the activated charcoal and also of other factors which control the efficiency of the charcoal and the accuracy of results obtained by its use in analytical work.

WHEN THE GUARANTEE BECOMES A BOOMERANG

(Continued from page 834)

or the durability and ease with which it might be kept clean. Again and again he repeated the statement:

A Sale Made on a Pure Guarantee Basis

"But you run no risk, madam. If at any time this proves unsatisfactory, all you've got to do is to bring back this article and get a brand new one. Remember, if a hole ever makes its appearance, we are right here and ready to stand back of this ware."

On this particular argument, the woman bought the utensil. She took it home and said to her daughters:

"I have paid a big price for this utensil. It is absolutely guaranteed. If it ever leaks, we are to get a new one. Keep watch of it."

And so from that day on, mother and two daughters kept an eagle eye on that utensil. Every time they used it, they held it up to the light. They were not especially careful in scraping and digging it when anything scorched to the bottom. The ticket on the ware distinctly said that the metal of this article was attacked and injured by strong alkalies. The salesman had said nothing about that.

One day some four years later, a strong solution of washing soda was boiled up in the utensil. The liquid was allowed to stand in it, and not long after a hole appeared. The piece of goods was not to blame. It was first-class in every way. Nevertheless, the woman marched back and got a brand new article.

Even if the manufacturer made good, the retailer suffered because he had to make two sales to insure his profit on one, and there was a decided loss of confidence through the transaction.

Danger of Over-Emphasizing the Guarantee

Where the guarantee is made the main selling argument, a wrong impression is very likely to be planted in the mind of the customer. He is sold on the expectation that sooner or later he will meet trouble, and that the store stands ready to remedy that trouble fully and absolutely.

Naturally the customer keeps watch for the first symptom of any condition upon which he may make a claim for adjustment, and having to make good on too many guarantees, such business becomes a boomerang of no uncertain character. It is all right and eminently proper to make good when the goods can be proven to be at fault, but a blanket guarantee that takes nothing in the way of ill-treatment into account is dangerous in the extreme.

Sometimes it is well to stage a sample sale as a lesson for business associates, so as to show that goods of merit can and should be sold on their merits; and that where the guarantee is mentioned, that it should be mentioned incident to proper use, and not made to cover abuse of the article, or the improper use of supplies.

Conditions of the Guarantee Should Be Plainly Stated

Whenever a guarantee is made at all, the conditions of that guarantee should be clear and simple. Naturally the guarantee should not be hedged about with a lot of red tape or provisions making it useless. It should be fair to all concerned.

A good many firms have the habit of making a record of guaranteed sales, so that they can check up on the number of come-backs and the adjustments made. Salesmen may well be instructed that in selling guaranteed goods, the value of the article should be given first consideration; and that the customer should be sold on comfort, style, durability, or satisfaction in some form, rather than on the guarantee end of the transaction.

It is legitimate to mention the guarantee with proper reservations, making it plain that in all cases fair usage of the article is presupposed. This attitude and type of salesmanship will sell just as many if not more guaranteed goods, and will prevent the exercise of suspicious watchfulness on the part of the customer, which will be likely, in the long run, to act as a boomerang which will deal the retailer an unfair and unmerited blow.

Current Market Prices

COALS (By Courtesy of Coal Age)

A. Bituminous.

(Spot prices, F. O. B., mines, net tons).

High Volatile, Eastern	Market	Price
Pool 54-64 (Gas Standard)	New York	$1.35 to $1.65
Pittsburgh screened gas	Pittsburgh	2.30 to 2.50
Pittsburgh gas, mine run	Pittsburgh	2.00 to 2.25
Kanawha lump	Columbus	2.00 to 2.25
Kanawha mine run	Columbus	1.30 to 1.55
West Virginia lump	Cincinnati	1.85 to 2.25
W. Virginia gas mine run	Cincinnati	1.40 to 1.60
Midwest		
Indiana 4th vein lump	Chicago	2.75 to 3.00
Indiana 4th vein mine run	Chicago	2.25 to 2.50
South and Southwest		
Big Seam lump	Birmingham	3.30 to 3.50
Big Seam mine run	Birmingham	1.50 to 2.00
Southeast Kentucky lump	Louisville	2.50 to 2.75
Southeast Kentucky mine run	Louisville	1.50 to 2.00

B. Anthracite.

(Spot prices F. O. B. mines, gross tons).

	Market	Freight rates	Independent	Company
Egg	New York	$2.34	$8.50 to $13.00	$8.00 to $8.35
Egg	Philadelphia	2.39	9.25 to 11.00	8.10 to 8.35
Egg	Chicago (net tons)	5.06	8.50 to 12.00	7.25 to 7.45

COKE (By Courtesy of Iron Trade Review).

Connellsville, furnace	$3.00
Wise County, furnace	$4.50 to 5.00
Alabama, furnace	4.50 to 5.00
Foundry, Newark, N. J., del	10.41
Foundry, Chicago, ovens	10.75
Foundry, Boston, delivered	11.50
Foundry, St. Louis	11.00
Foundry, Granite City, Ill	9.00
Foundry, Alabama	4.50 to 5.50

PETROLEUM (By Courtesy of Oil, Paint & Drug Reporter)

(Prices at wells, per bbl.)

Pennsylvania—Ohio—West Virginia.	
Cabell, West Virginia	1.45
Corning, Ohio	1.75
Lima	1.83
Pennsylvania	$2.75 to 2.85
Wooster, Ohio	1.65
Indiana—Illinois.	
Illinois	1.62
Indiana	1.63
Oklahoma—Kansas.	
Healdton	.90
Mid-continent (low gravity)	.90 to 1.05
Gulf Coast.	
Gulf Coast, Grade A	$1.35
Gulf Coast, Grade B	1.15

GAS OILS.

Gas Oil, Bayonne, bulk gal	5¼ to 5½c
Gas Oil (32-36) Oklahoma, gal.	2⅝ to 2⅞c
Gas Oil (32-36) Gulf Coast, gal	3½ to 4

PIPE AND FITTINGS—CAST IRON GAS PIPE.

(By Courtesy Iron Trade Review.)

Four-inch, Chicago	$61.20 to $62.20
Six-inch and over, Chicago	57.20 to 59.20
Four-inch, Birmingham	56.00 to 59.00
Six-inch and over, Birmingham	52.00 to 53.00
Four-inch, New York	69.60 to 71.60
Six-inch and over, New York	64.60 to 65.60
Standard fittings, Birmingham, base	115.00

6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20.

BY-PRODUCTS

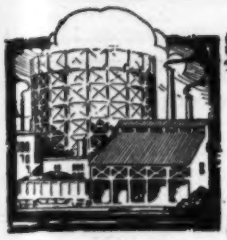
(By Courtesy of Oil, Paint and Drug

Ammonia aqua, 16 deg. drums lb	5 to 5¼c
Ammonia aqua, 20 deg. drums lb	6¼ to 6½c
Ammonia aqua, 26 deg. drums lb	6½ to 7 c
Ammonia squa, anhydrous cylinder, lb	30 to 36 c
Ammonium sulphate, bulk F. O. B. Works, per 100 lbs	$2.60 to $2.65
Potash prussiate, yellow casks, lb	18½ to 19 c
Potash prussiate, red casks, lb	37½ to 40 c
Soda prussiate, yellow casks,	10 to 10½c
Soda sulphocyanide, barrels, lb	45 to 55 c

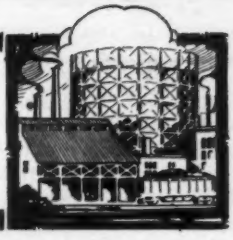
COAL TAR BASIC PRODUCTS.

(By Courtesy of Oil, Paint and Drug Reporter)

Benzol C. P. tanks, works, gal.	24 to 25c
Benzol, drums, gal	30c
Benzol, 90% tanks, works, gal.	23c
Benzol, 90% drums, gal	28c
Napthalene, flake, barrels, lb	4½ to 5 c
Napthalene, dyestuff bags, lb	4½ to 5 c
Solvent Naphtha, water white works, gal.	24 to 25c
Solvent Naphtha, drums, works, gal	29 to 30c
Toluene, C. P. tanks, works, gal.	31c
Toluene C. P. drums, works, gal	36c



NEWS OF THE GAS INDUSTRY



Program of Annual Meeting of Pacific Gas Association

Monday September 15.

Morning, 6 a. m. to noon—Registration and greetings. All members with their guests are requested to register at the registration desk in the main lobby of the hotel.

Noon, 12:30 p. m .to 1:30 p. m.—Luncheon, main dining room.

Afternoon, 2 p. m. to 5 p. m.—Business session, grill room, President H. R. Basford presiding; president's address; secretary's report; report of publicity committee, F. S. Myrtle chairman; "Experiences," John Clements, editor; general business; election of officers.

6:30 p. m. to 7:30 p. m.—Dinner, main dining room.

Evening, 8 p. m. to 12 p. m.—Dancing.

Tuesday, September 16

Morning, 9:30 a. m. to 12:30 p. m.—Parallel sessions of commercial and accounting sections. Commercial section, grill room, L. F. Galbraith chairman. Merchandising Methods—Report of Merchandising Bureau, A. L. Crane chairman; "Making the Public Think About It"—Report of Advertising Bureau, N. B. Drury chairman. Accounting section, ball room, C. W. Platt chairman. Gas Utility Statistics—Report of Committee on Utility Statistics, M. J. Wilkinson chairman; Gas Utility Budgets—Report of Committee on Budgetary Control, O. L. Moore chairman; Keeping Costs—Report of Committee on Cost Accounting, D. G. Martin chairman.

Noon, 12:30 p. m. to 2 p. m. Luncheon, main dining room. During luncheon there will be a three-minute speaking contest under the auspices of the Commercial Section on the subject: "The Value of a Sales Force to a Gas Company." The talks will be judged on points and a "Distinguished Service Memento" awarded the victor.

Afternoon, 2 p. m. to 5 p. m.—Parallel sessions of technical and commercial sections. Technical section, grill room, W. S. Yard chairman. Sources of Leakage—Report of Committee on Unaccounted for Gas, R. S. Fuller chairman; Meter Statistics—Report of Committee on Consumers' Meters, C. R. Miller chairman; Status of Appliance Testing Code—Report of Committee on Appliance Testing, R. M. Conner chairman; Carbon Monoide—Paper and Demonstration of the Pyrotannic Test, Walter M. Berry; Tests for Pipe Fittings—Paper by Otto Goldkamp; Use of Compressed Air in Construction Work—Paper by S. P. Duckel. Commercial section, ball room, L. F. Galbraith chairman. Responsivility for Service—Report of Home Service Bureau, W. M. Henderson chairman; Industrial Markets for Gas—Report of Industrial Utilization Bureau, J. H. Gumz chairman.

6:30 p. m. to 7:30 p. m.—Dinner, main dining room.

8:30 p. m.—Theater party, Granada Theater.

Wednesday, September 17

Morning, 9:30 a. m. to 12:30 p. m.—Parallel sessions of technical and accounting sections. Technical section, grill room, W. S. Yard chairman. Oil Scrubbing—Report of Committee on Naphthalene Removal, K. C. Tomlinton chairman; Gas Appliance Standards—Report of Committee on Standardization and Testing of Gas Appliances, H. M. Crawford chairman; Comparative Cost of High Pressure and Low Pressure Distribution—Paper by R. S. Fuller; Welded Mains for Low Pressure—Paper by R. M. McCalley. Accounting section, ball room, C. W. Platt chairman. Office Efficiency—Report of Committee on Contracts and Work Orders. F. L. Nagel chairman; Keeping Track of Customers' Accounts—Report of Committee on Customers' Bookkeeping, Frank Ingram chairman; The Financial Side—Report of Committee on Credits and Collections, J. E. Murphy chairman.

Noon, 12:30 p. m. to 1:30 p. m.—Luncheon, main dining room.

Afternoon—There will be no business sessions, the afternoon being devoted to competitions in golf and swimming, and to scenic drives in the vicinity of Santa Barbara. W. M. Thompson, sports chairman.

1:30 p. m.—Golf. Cars will leave the hotel for La Cumbre Golf Club. All registered members and their guests are invited to enter the golf tournament in competition for the Babcock-Pederson-Gasford challenge cup.

2 p. m.—Cars will leave the hotel for a drive through Scenic Montecito, with visit to the Knapp estate. This drive will end at the beach in time for the push ball contest and swimming races.

4:30 p. m.—Los Banos Del Mar, aquatic sports. Push ball contest—no rules—no talent. This is guaranteed to be the worst push ball game ever played. Los Angeles vs. the World. Swimming races—free-for-all up to the limit of the tank capacity.

6:30 p. m. to 7:30 p. m.—Dinner, main dining room.

Evening, 8:30 p. m. to 12 p. m.—Convention ball, informal.

Thursday, September 18

Morning, 9:30 a. m. to 12:30 p. m.—General sessions under auspices of public relations section, grill room, D. C. Ray Chairman. Your Contact with the Public—Report of Committee on Employees' Relations with the Public, W. H. Barton chairman; Customer Ownership—Report of Committee on Customer Ownership, Frank A. Easton chairman; Science vs. Simplicity in Rates—Report of Committee on Rates and Tariffs, A. F. Bridge chairman; Educating the Public—Report of Committee on Information. C. A. Luckenbach chairman; History and Purpose of the Gas Appliance Society—Report of Committee on Contact with Gas Appliances Dealers, G. P. Egleston

chairman; Accident Prevention and Welfare—Report of Committee on Management, J. P. Coghlan chairman; "Human Relations as a Function of Management," address by E. G. McCann.

Noon, 12:30 p. m.—Convention photograph on lawn.
12:45 p. m. to 1:30 p. m.—Luncheon, main dining room.

Afternoon, 2 p. m. to 5 p. m.—Technical section, grill room, W. S. Yard chairman. Measure of Gas Under High Pressure—Report of Committee on Natural Gas, Wm. Moeller, Jr., chairman; Soil Corrosion—Paper by H. S. Christopher; Internal Corrosion—Paper by W. V. Watson; Firebrick and Refractories—Paper by M. J. Cereghino. Immediately following the technical section program there will be a general business session, President H. R. Basford presiding. Unfinished business; Report of gas engineering degree committee, H. M. Crawford chairman; report of resolutions committee.

Evening, 6:30 p. m. to 10 p. m.—Annual banquet of the Pacific Coast Gas Association. "Let's Be Human," James W. Foley; address, speaker and subject to be announced; adjournment.

Ladies' Program

A number of Mah-Jong sets will be available at the registration desk for the use of members and guests, but in order to avert a shortage it is suggested that ladies addicted to this pastime bring their own sets.

Monday afternoon, 4 p. m.—Tea will be served on veranda at which the members of the ladies' committee will act as hostesses.

Monday evening—Dancing, Arlington ball room.

Tuesday afternoon, 2:30 p. m.—Drive through Hope Ranch; tea at Samarkand Hotel.

Tuesday evening, 8:30 p. m.—Theater party, Granada Theater.

Wednesday afternoon, 2 p. m.—Drive through Montecito, "City of Beautiful Homes," with trip through the Knapp estate. This drive will terminate at the beach in time for the push ball contest and swimming races at 4:30 p. m.

Wednesday evening, 8:30 p. m.—Convention ball, Arlington ball room, informal.

Thursday afternoon, 2:30 p. m.—Visit to Santa Barbara Mission and drive through Mission Canyon; tea at Paseo De La Guerra.

Thursday evening, 6:30 p. m.—Annual banquet of the Pacific Coast Gas Association.

New York Central Electric Corporation Plans Further Extension

Albany, N. Y.—The New York Central Electric Corporation of Perry, Wyoming county, has applied to the Public Service Commission for consent to acquire all of the common capital stock of the Empire Gas and Electric Company of Geneva, Ontario county. The company also asks permission to issue securities to make the purchase.

The stock of the Empire Gas and Electric Company is all held by the Empire Coke Company, and the agreement between the Empire Coke Company and the New York Central Electric Corporation for the sale of the Geneva stock was entered into August 29, the petition says. The Empire Gas and Electric Company was incorporated in April, 1911, and serves the city of Auburn, town of Aurelius, village of Cayuga and towns of Owasco, Sennett and Fleming in Cayuga county; village and town of Skanealeles, Onondago county; town and village of Seneca Falls, town and village of Waterloo, and town of Fayette in Seneca county, and the city and town of Geneva in Ontario county.

Purchase of the Empire Company by the New York Central Electric Corporation will enable the two companies to exchange service from their respective plants and to co-operate with each other in the manufacture and distribution of gas, electricity and power, thus giving the consumers of each company the benefit of improved and continuous service, says the petition. The territory served by the two companies is adjacent, and the petitioner states that its purpose in the acquisition of this company, as well as the acquisition of other properties in central and western New York, is to create a large system under a single company ownership which will permit of the production and distribution of gas, electricity and power at the minimum cost consistent with the best service.

The New York Central Electric Corporation was formed December 2, 1921, as the Wyoming Electric Corporation, the name being changed November 2, 1922.

Kingston Gas & Electric Co. to Extend Service

Albany, N. Y.—The Kingston Gas and Electric Company has made application to the Public Service Commission to extend both its gas and electric lines into the town of Kingston, Ulster county, and supply the inhabitants with gas and electricity. Franchise was granted by the town board under date of August 29.

Southern Gas Proceedings Available

The 1924 proceedings of the Southern Gas Association, covering the sixteenth annual meeting at Augusta, Ga., April, 1924, have been forwarded to the members of the Southern Gas Association. Any member not receiving a copy of the proceedings is requested to notify the secretary, Mr. J. P. Connolly, 141 Meeting street, Charleston, S. C.

A Gas Man Honored

George S. Hawley, vice-president and general manager of the Bridgeport Gas Light Company, was recently named director of the Connecticut Chamber of Commerce, representing the Bridgeport Chamber of Commerce. Mr. Hawlay was elected at the last meeting of the latter organization, which was held in Bridgeport at the University Club. Mr. Hawley succeeds W. B. Spencer, of the Bridgeport Coach Lace Company.

Gas Company to Expand

Hoosac Falls, N. Y.—Twin State Gas and Electric Company, 160 State street, Boston, Mass., has awarded a contract to the F. T. Ley Company of Boston for the erection of a new plant in this city. The plans call for a one-story building, 30 feet high, 30x50 feet, of reinforced concrete and stone, costing in the neighborhood of $100,000.

Seeks Ban on Gas "Cut-Off" Device in Supreme Court

New York—About the stiffest fight it has had to face confronts the gas cut-off device today which, after many months of battle to determine which one of many devices should be accepted, finally was put in working order by an ordinance passed by the Board of Aldermen.

Application has been made before Justice MacCrate in the Supreme Court here for an order to restrain Assistant Fire Chief Thomas J. Hayes from enforcing the ordinance which requires house builders and house owners to put the device in place as a protection against fire.

The application was made by A. J. Halprin for the United Real Estate Owners' Association and the Greater New York Taxpayers' Association. Through agreement with the Corporation Counsel's office the enforcement was held up until the application can be argued on September 8.

Stewart Browne, president of the United Real Estate Owners' Association, is back of the suit, and said that he intended to "let in some light" on the situation. He said the cost of installing the device, instead of being $25, as promised tentatively, was all the way from $100 to $150, and that the total would run into many millions of dollars. It was given out that those back of the suit with Mr. Browne numbered 25,000, with real estate holdings of more than $25,000,000. He threatens to subpoena the Mayor in the case.

The gas cut-off device has had a career of much trouble so far. About 18 months ago it was adopted as a device that would mean a tremendous saving to the property owners of the city from fire loss. It is supposed to cut off the gas from buildings when fire is threatened, thus preventing the inflammable fluid from adding to the danger of fire.

Gas Plant Enlarged

Chehalis, Wash.—Reconstruction aggregating $15,000 is being done at the gas plant, owned by the North Pacific Service Company, which supplies both Chehalis and Centralia. Installation of the new improvements will increase the capacity of the plant by one-third. Added supply of gas has been made necessary by increased demand for service in the Twin Cities.

Utility Program at Temple University, Philadelphia, Pa.

Supplementing the previous announcement regarding the utility courses to be given at Temple University during the coming winter under the auspices of the Pennsylvania Public Service Information Committee, it is now practicable to give information regarding these courses in more complete detail.

These courses cover the technical phases of the central station electric, manufactured gas, electric railway and telephone utilities, and a comprehensive course dealing with the general business and economics common to all utilities. These courses are all given in lecture form, competent operators and executives have been obtained as lecturers.

For the Gas Industry

Of particular interest to the gas industry is the course covering that field and the general course. The outline of the former course and lectures is subjoined:

Course in Gas Engineering

1. Coal gas; horizontal retorts, Mr. J. Van G. Postles.
2. Coal gas; vertical retorts, Mr. Postles.
3. Coke ovens, J. K. Mawha.
4. Blue gas and boiler plant, L. B. Eichengreen.
5. Carburetted water gas, Mr. Eichengreen.
6. Purification, scrubbing and condensing, A. F. Kunberger.
7. By-products, Mr. Kunberger.
8. Station meters, holders, B. V. Pfeiffer.
9. Distribution of gas, A. M. Boyd.
10. Low pressure systems, Mr. Boyd.
11. High pressure systems, Mr. Boyd.
12. Consumers' meters, W. J. Castor.
13. Appliances—combustion, C. C. Winterstein.
14. Testing of gas, calorimetry, etc., E. J. Brady.
15. Gas standards, C. E. Reinicker.

The outline of the general course and lecturers is subjoined:

Outline of General Course

1. General talk, P. H. Gadsden, vice-president, the United Gas Improvement Company.
2. General business economics, J. O. Keller, professor industrial engineering, Pennsylvania State College.
3. Public utilities and privately owned business undertakings, H. H. Aylesworth, managing director, National Electric Light Association.
4. Duties of public utilities; rights of public utilities, J. T. Hutchings, vice-president, the United Gas Improvement Company.
5. Regulation by public service commissions, Alex. Forward, secretary-manager, American Gas Association.
6. The corporate organization of a public utility, L. R. Dutton, manager, Philadelphia Suburban Gas and Electric Company.
7. Analysis of balance sheet and income statement, J. E. Zimmerman, Day & Zimmerman, Inc., Engineers. (x)
8. The financing of public utilities, W. W. Bodine, assistant to general manager, the United Gas Improvement Company.
9. Methods of obtaining value, C. J. Joyce, counsel, Philadelphia Rapid Transit Company.
10. Valuations and appraisals, Mr. Joyce.
11. Rate of return, Mr. Joyce.
12. Rate systems, C. J. Russell, vice-president, the Philadelphia Electric Company.
13. The Uses to which revenue is put, W. H. Johnson, president, the Philadelphia Electric Company.
14. Publicity and public relations, P. C. Staples, vice-president, the Bell Telephone Company of Pennsylvania.
15. Importance of employees in development of public utilities, A. A. Mitten, supervisor of industrial relations, Philadelphia Rapid Transit Company.

x Tentative.

Contracts Awarded

The Lansing (Mich.) Fuel & Gas Company is increasing the capacity of its condensing plant, and to that end has contracted with the U. G. I. Contracting Company of Philadelphia for the furnishing and erection of an eight-foot diameter U. G. I. high duty condenser.

This condenser will be installed complete with latest type of temperature controls.

Northern Indiana Gas Closes Preferred Stock Campaign

Chicago, Ill.—Sale of class "A" 7 per cent preferred stock of the Northern Indiana Gas and Electric Company has closed, according to announcement, a total of $6,000,000 worth of these securities having been sold during the last ten months.

The company today has 15,298 stockholders, including those who are buying the securities on the monthly savings plan. More than half of that number are fully paid-up stockholders. A large percentage of the stockholders are customers and employees of the company.

The stock is widely distributed, the average number of shares held being only four per stockholder. Employees of the company who are stockholders number 1,239, or 74 per cent of all the employees.

Sale of the securities began last fall, a few months after Samuel Insull and associates assumed management of the company. In selling the company's securities to its customers and employees the new management followed out the customer and employee ownership plan which has proved so successful in other companies under the same management and in other public utility companies throughout the country.

The sale was conducted by public utility employees, who were divided into stock selling teams. There were many competitive contests between these teams and the employees of the various cities served by the company. Women employees took an active part in the campaign and the reports show that 228 women employees sold a total of 3,566 shares of the stock.

During the last six weeks a special drive was made for the purpose of getting as many employees as possible to sell one or more shares during that period, and 34 per cent of the employees participated in this whirlwind finish of the stock selling campaign.

The U. G. I. Contracting Company of Philadelphia has been awarded contract by the Brooklyn Borough Gas Company for furnishing and installing an 11-foot

Big Gas Merger by Southern Gas and Power Corporation

Announcement has just been made by the executives of the Southern Gas and Power Corporation of the final and successful consummation of negotiations that have been in progress for some time past, whereby that company comes into possession of a large group of natural and manufactured gas and allied products located in the counties of this state and the western part of Maryland. The companies taken over are all comprised in the group heretofore controlled by the Eastern Oil Company of West Virginia and of the Cumberland and Western Gas Company of Cumberland, Md. They supply natural and artificial gas to over sixty communities in West Virginia and Maryland with approximately 25,000 consumers, which will give the Southern Gas and Power Corporation a total of over 40,000 consumers with a gross income to the corporation of over $2,000,000.

This progressive and fast expanding organization is now definitely and prominently identified with the leaders in the public utility field of the gas country and constantly improving its position. It is expected that with the economies and further improvements to be carried out, lower rates and better service can be accorded its customers. If the remarkable showing made in Bluefield since the acquisition of the local company is any criterion, great things can be looked for by the consumers and investors in this region.

The companies transferred by the Eastern Oil Company are West Virginia Central Gas Company and West Virginia and Maryland Gas Company of West Virginia, and the West Virginia and Maryland Gas Company of Maryland and the Northern Natural Gas Company of Maryland.

In the transfer, which is most comprehensively favorable to purchaser, includes gas rights under leases covering approximately 10,000 acres in Barbour, Taylor and Preston counties, West Virginia, with 127 gas wells thereon, and approximately 520,000 feet of field gathering lines ranging from two inches to twelve inches in size, with rights of way in Braxton and Gilmer counties, West Virginia; 27,000 acres, with 25 producing wells and approximately 125,000 feet of field gathering lines; gas rights under these leases for 3,000 acres in Barbour, Taylor and Preston counties, West Virginia, on which no developments have been made, but are expected to greatly increase the supply to be needed by the corporation.

Adopting the policy found so successful by others of the large utility corporations of the country, this corporation seeks the full cooperation and support of its customers by encouraging them to become actual partners in its affairs by purchasing one or more shares of its 7 per cent preferred stock, the dividends on which are payable every quarter. Small investors have the same opportunity as the man with abundant means, as a plan of partial payment has been arranged to meet the most humble beginner.

Toledo to Sell Its Gas Plant

Toledo, O.—Sale of the city's gas plant to the Toledo Edison Company for $125,000 has been recommended to the council by its finance committee.

The sale of the gas plant was negotiated by Finance Director Stewart. The formality of advertising for bids must be observed, but there is only one likely bidder for the old plant, now consisting largely of mains, which a score of years ago was the city's attempt to operate a municipal natural gas plant.

New Erie Gas Plant

Erie, Pa.—The Pickands Mather Company, Cleveland, and the Pennsylvania Gas Company will erect an artificial gas plant which will produce 4,000,000 cubic feet of gas daily and which will be blended with the present artificial supply. The Pickands Mather Company, owners of the Perry Iron Works here, will expend $3,000,000 on the construction of a modern converter plant for the making of its own coke and will sell the gas to the Pennsylvania Company, which will expend over $2,000,000 in construction of a blending plant and compressor station and in extending mains.